

West Valley Demonstration Project

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Nuclear Regulatory Commission Piezometer Installation Plan

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**NUCLEAR REGULATORY COMMISSION-LICENSED DISPOSAL AREA
PIEZOMETER INSTALLATION PLAN**

1.0 PROJECT DESCRIPTION

1.1 General Overview

This piezometer installation plan has been prepared under the Resource Conservation and Recovery Act (RCRA) 3008(h) Administrative Order on Consent (U.S. Environmental Protection Agency 1992), in response to comments on the RCRA Facility Investigation (RFI) Report, Nuclear Regulatory Commission (NRC) - Licensed Disposal Area (NDA) - Volume 2 (West Valley Nuclear Services, Co., Inc. September 1995).

New York State Department of Environmental Conservation (NYSDEC) requested additional information on how the West Valley Demonstration Project (WVDP) evaluates and demonstrates the hydraulic effectiveness of the NDA interceptor trench.

Cross sections were produced showing groundwater levels in and outside the NDA and in the interceptor trench. Two of these cross sections are shown on Figure 1 in plan view (one running north-south (A) and the second running east-west (B)), and were evaluated to assess the effectiveness of the trench. The water level data evaluated indicates that the water table in the weathered Lavery till in the NDA slopes towards and is captured by the NDA interceptor trench. Attempts were made to evaluate the hydraulic gradient along the northwest side, however, wells were positioned outside the area of trench influence. As a result, two additional piezometers are proposed on the northwest side straddling the trench to provide coverage for this side of the NDA (cross-section C). In addition, one new piezometer is proposed along each of the two existing cross sections to provide supplementary hydraulic information inside the NDA (see Figure 1).

Water levels from the new and existing piezometers and existing wells at the NDA will be used to evaluate the hydraulic gradient along the trench.

Currently, well 909, trench manhole #4 (NDATR), and piezometers NDA-WP-B and NDA-WP-C are monitoring cross-section A. Well 1109a and piezometer 90-I-7 will monitor cross-section B. Each of these cross sections will have a new piezometer installed (96-I-01 and 96-I-02, respectively) at the midpoint and the northeast side of the trench to provide supplementary hydraulic information. For cross-section C, two new piezometers, 96-I-03 and 96-I-04, will be placed along the northwest side of the NDA to assist in evaluation of the influence on the trench for the northwest portion of the NDA. Besides the two new piezometers, trench manhole #2 will also be monitored along this line (see Figure 1).

Monitoring of these wells/piezometers will be conducted in accordance with the Groundwater Monitoring Plan, WVDP-239 (West Valley Nuclear Services Co., Inc. December 13, 1995) (see Section 4.0).

2.0 PIEZOMETER INSTALLATION PROTOCOLS

2.1 Installation Protocols

Prior to piezometer installation, a visual inspection of the locations will be conducted to ensure that a standard drill rig will be capable of accessing the area, an underground utility review will be conducted and the piezometer locations will be labeled and staked.

All piezometers will be placed at the unweathered-weathered till interface. The interface will be determined in the field, at the discretion of a qualified geologist, by continuous soil sampling. Typically, this would be expected to occur at 15 to 20-feet below ground surface.

For each of the proposed piezometers to be installed, the method of drilling and sampling will proceed as follows:

- FC1>
- Each piezometer will be advanced using 4 1/4-inch I.D. continuous flight hollow stem augers. Continuous soil samples will be obtained using the standard penetration test (SPT) method and all soil observations will be recorded in accordance with Drilling, Soil Sampling, and Geologic Logging Procedures, EM-500 (Dames and Moore. May 20, 1996). The piezometer will be completed through the hollow stem of the augers as a 2-inch installation in the following manner as shown in Figure 2.

Prior to installation, the borehole walls will be scraped with brushes to remove any smeared clay, this will allow the sealed fractures to open.
 - A 2-inch diameter #10 slotted PVC (Schedule 40) well screen measuring 5 or 10-feet in length, depending on till interface depth, will be attached to 2-inch PVC (Schedule 40) riser pipe. The well assembly will be lowered through the augers to the desired screened interval (lower portion of the weathered till). Suitably graded and washed silica sand (#3) will be placed through the augers to a height of 2-feet above the top of the screen.
 - A bentonite pellet seal measuring 2 vertical feet will be installed above the sand pack. The remainder of the boring will then be filled with a pure bentonite grout within 5 feet of ground surface. Once the grout has set, the remaining portion of the unfilled boring will be filled with concrete to stabilize the 2-inch diameter riser pipe. A lockable 6-inch diameter steel protective casing will be centered over the 2-inch casing and will extend into the concrete a minimum of 2 feet.

- A concrete (4000 psi, fiber mesh) security collar measuring 4-feet square by 4-inches thick will be installed flush with the ground surface around the surface casing. The collar shall be sloped to promote surface drainage away from the piezometer (see Figure 3).
- A 3/8-inch diameter weep hole will be drilled into the protective casing to facilitate drainage of water from the inside of the casing.
- A nominal stickup of 2 feet will be used as illustrated in Figure 2.

2.2 Piezometer Development

All piezometers will be developed to a silt free condition using suitable means under protocols listed in "Monitoring Well Development, EM-519 (Dames & Moore October 20, 1995)."

2.3 Piezometer Identification

Upon completion of the drilling activities, each piezometer will be capped and clearly marked with its own identification.

The location and top of casing elevation of each well will be surveyed to provide horizontal and vertical control.

2.4 Field Documentation

2.4.1 Field Reports

FC1> The field geologist will prepare a daily field drilling report, borehole drilling logs, and a well construction diagram for each piezometer in accordance with procedures found in Drilling, Soil Sampling, and Geologic Logging Procedures, EM-500 (Dames and Moore. May 20, 1996).

Daily reports will be used to keep track of the drilling subcontractor's progress and the work completed.

2.4.2 Field Notebook

The field notebook entries will be entered in indelible ink and all modifications shall be crossed out with a single line, initialed, and dated. Each page will be signed as it is generated and countersigned upon review by a second party. When the field notebook is not in use, it will be kept in a fireproof metal cabinet per Environmental Assessment and Environmental Monitoring Record Management, EM-105 (Dames & Moore November 30, 1994)

FC1> All pertinent information concerning the borehole soil and piezometer will be incorporated into the site well inventory database and maintenance/inspection schedule. The piezometers will be inspected and maintained under the provisions of Well Inventory/Protection Program - Inspection and Evaluation of Existing Monitoring Wells, EMP-515 (West Valley Nuclear Services Co., Inc. May 8, 1996).

3.0 WASTE DISPOSITION

3.1 Soil

All soil removed from the boring will be radiologically surveyed. All excavated soil that is radiologically "clean" will be salvaged for needed grading around the completed piezometers. Soil that is contaminated with radioactivity in excess of background levels shall be boxed, or otherwise segregated, according to procedures set forth in the WVDP Radiological Controls Manual, WVDP-010, (West Valley Nuclear Services Co., Inc. October 24, 1995). The release limits shall be those specified in this manual. Any soil that is contaminated in excess of background levels shall be stored for dispositioning per Waste Status Determination, SOP 300-07 (West Valley Nuclear Services Co., Inc. February 8, 1996).

3.2 Groundwater

All groundwater brought to the surface during the course of the drilling or development will be collected and contained in 55-gallon drums for subsequent treatment or storage per SOP 300-07.

4.0 HYDRAULIC MONITORING PROGRAM

4.1 General

The newly installed piezometers, existing wells, and interceptor trench, along each cross section will be monitored in accordance with the Groundwater Monitoring Plan, WVDP-239 (West Valley Nuclear Services Co., Inc. December 13, 1995) to verify an inward hydraulic gradient in the weathered Lavery till to the interceptor trench at the NDA. Hydraulic monitoring of these piezometers will commence during the first monitoring event performed following their installation and development.

4.2 Water Level Measurement Procedures

FC1> Water level measurements will be accomplished using an electric water level indicator. Water level measurements will be referenced to a dedicated mark on the inner casing of each piezometer and well. This mark will be used each time a water level measurement is collected. Water level measurements will be recorded to the nearest 0.01-foot per procedure in Groundwater Sampling, EM-6 (Dames & Moore May 9, 1996).

4.3 Field Documentation

All water level data collection activities performed will be documented in a field notebook per Environmental Assessment and Environmental Monitoring Record Management, EM-105 (Dames & Moore November 30, 1994). The field notebook should include the following: date and time of data collection, location of data collection, identification of persons collecting the data, a description of weather conditions during data collection, type of water level indicator used for data collection, and any problems encountered in the field during data collection.

5.0 DATA EVALUATION AND REPORTING

All water level data from the field will be converted to a measurement in elevation below the ground surface.

These elevations will be evaluated to determine the effect the NDA interceptor trench has on the groundwater flow in the weathered Lavery till. The water level measurements will be plotted on cross sections (three in total) and will be reported in accordance with processes in the Groundwater Monitoring Plan, WVDP-239 (West Valley Nuclear Services Co., Inc. December 13, 1995).

6.0 PROJECT SCHEDULE

A schedule for piezometer installation, development, and water level monitoring is presented in Figure 4.

Piezometer installation is scheduled for the month of August 1996. This will allow for drier weather conditions and allow easier access to the drilling locations.

7.0 PROJECT MANAGEMENT

To ensure that the NDA piezometer installation and monitoring program proceeds expediently, and that associated documents are complete, accurate, and accessible, general specifications for the overall project management of the program have been developed. These specifications are described in the following subsection.

7.1 Project Organization and Responsibilities

The Environmental Programs Department of WVNS is responsible for all managerial aspects of the NDA piezometer installations. The WVNS Environmental Affairs (EA) department will be responsible for ensuring that the piezometer monitoring program is incorporated into the groundwater monitoring program schedule. EA will also be responsible for regular oversight of the monitoring program. All monitoring program data will be sent to the Department of Energy for review and reporting in accordance with the Groundwater Monitoring Plan, WVDP-239 (West Valley Nuclear Services Co., Inc. December 13, 1995).

8.0 RECORDS MAINTENANCE

- FC1> 8.1 Records generated as a result of implementing this document are
FC1> identified below. They will be maintained per Environmental
Assessment and Environmental Monitoring Record Management, EM-105
(Dames & Moore November 30, 1994) and WVNS Manual for Records
management and Storage, WVDP-262, (West Valley Nuclear Services Co.,
March 24, 2000).
- FC1> 8.1.1 Field notebooks
- FC1> 8.1.2 Borehole logs
- FC1> 8.1.3 Well construction details
- FC1> 8.1.4 Water level data
- FC1> 8.2 Records are identified on Environmental Projects, Records Inventory
and Disposition Schedule (RIDS).
- FC1> 8.3 Records shall be prepared, maintained, and transferred to Records
Management for storage in accordance with WVDP-262.

9.0 HEALTH AND SAFETY

9.1 General

Health and safety is mandatory for all on-site employees, contractors, and subcontractors engaged in the NDA piezometer installation activities.

WVDP personnel, contractors, subcontractors, and visitors are required to perform operations in accordance with DOE orders and site industrial radiation and safety procedures.

WVDP contractors and subcontractors will be required to provide a health and safety plan for their employees covering any exposure to hazardous materials and shall complete all work in accordance with that plan.

An Industrial Work Permit (IWP) and Radiation Work Permit (RWP) will be obtained, as required. Project personnel will follow all prescribed precautions on the IWP and RWP.

9.2 Training

All personnel engaged in on-site NDA piezometer installation activities shall, as a minimum, have received 40 hours of health and safety training for hazardous waste operations and WVDP Radiation Worker II Training. This training, which includes respirator training, shall have been conducted before beginning field work at the site. The level of training shall be consistent with the job function and responsibilities of project personnel.

10.0 REFERENCES

- FC1> Dames & Moore. May 9, 1996. Groundwater Sampling, EM-6, Rev. 10.
- _____. November 30, 1994. Environmental Assessment and Environmental Monitoring Record Management, EM-105, Rev. 0.
- FC1> _____. May 20, 1996. Drilling, Soil Sampling, and Geologic Logging Procedures, EM-500, Rev. 5.
- _____. October 20, 1995. Monitoring Well Development. EM-519, Rev. 2
- FC1> West Valley Nuclear Services Company, Inc. May 8, 1996. Well Inventory/Protection Program - Inspection and Evaluation of Existing Monitoring Wells, EMP-515, Rev. 3.
- _____. February 8, 1996. Waste Status Determination. SOP 300-07, Rev. 6.
- _____. September 29, 1995. Records Management and Storage. WV-730, Rev. 10.

_____. October 24, 1995. WVDP Radiological Controls Manual. WVDP-010, Rev. 11.

_____. December 13, 1995. Groundwater Monitoring Plan. WVDP-239, Rev. 0.

_____. September 22, 1995, U.S. Nuclear Regulatory Commission-Licensed Disposal Area (NDA) Resource Conservation and Recovery Act (RCRA) Facility Investigation Report (RFI) - Volume 2, WVDP-RFI-018, Rev. 0.

U.S. Environmental Protection Agency. 1992. Administrative Order on Consent, Docket No. II RCRA-3008(h)-92-0202, Proceeding under Section 3008(h) of the Resource Conservation and Recovery Act, as amended.

New York State Department of Environmental Conservation. January 24, 1996. Letter, (DW:96:0094-RFI), Mr. Timothy I. DiGiulio and Mr. Andrew Bellina to E. A. Matthews, 3008(h) Order on Consent, Final RCRA Facility Investigation (RFI) Report Review, Nuclear Regulatory Commission-Licensed Disposal Area - Volume 2.

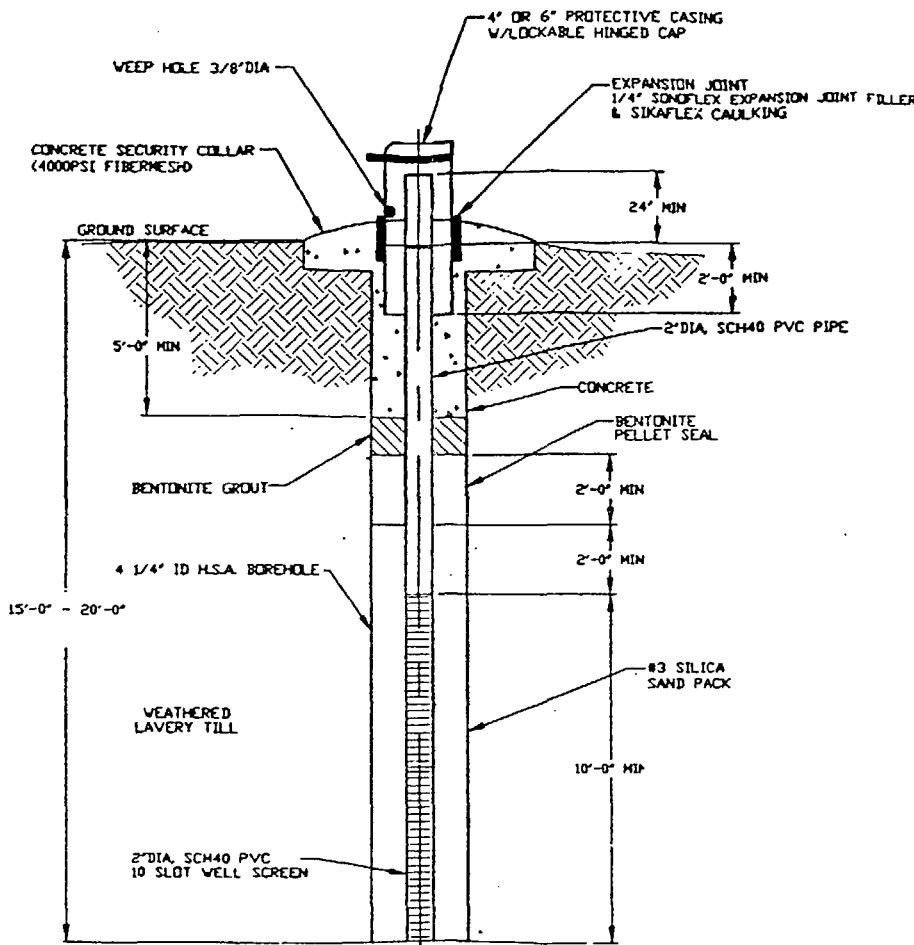
FIGURE 1
NRC LICENSED DISPOSAL AREA PIEZIOMETRIC CROSS SECTION

INSERT FIGURE 1

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NRC LICENSED DISPOSAL AREA PIEZIOMETRIC CROSS SECTION

FIGURE 2



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FIGURE 2

REVISIONS	APVD	UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS IN INCHES		DRAFTER J. HENRY	DATE 2/7/96	A/E CONTRACT NO.	CODE IDENT NO.	
	DESCRIPTION	TOLERANCES		DO NOT SCALE DRAWING	CHECKER H. BARKER	DATE 2/7/96	FOR WEST VALLEY NUCLEAR SERVICES CO. INC. WEST VALLEY N.Y.	
		2PL DEC ± N/A	3PL DEC ± N/A	FRAC TS ± 1/16	ANGLES ± N/A	FINISH N/A		DATE 2/7/96
		FILE NAME 6781B001						
		PLOT SCALE 1=12.00						
REV		D SPEC NO. 2736		DATABASE LINKED DRAWING		DWG NO.	REV	
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				A/E DWG NO.		SHEET 1 OF 1		

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FIGURE 3

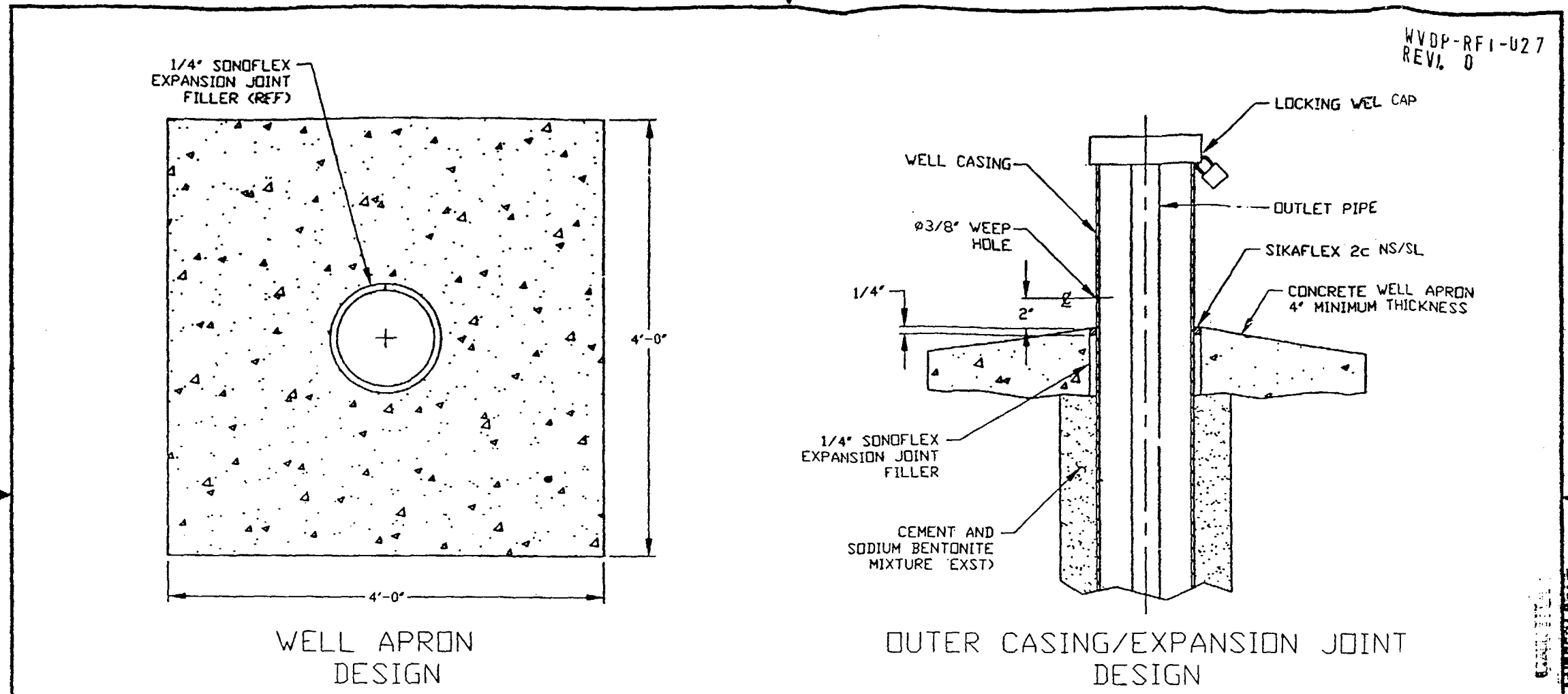


FIGURE #3

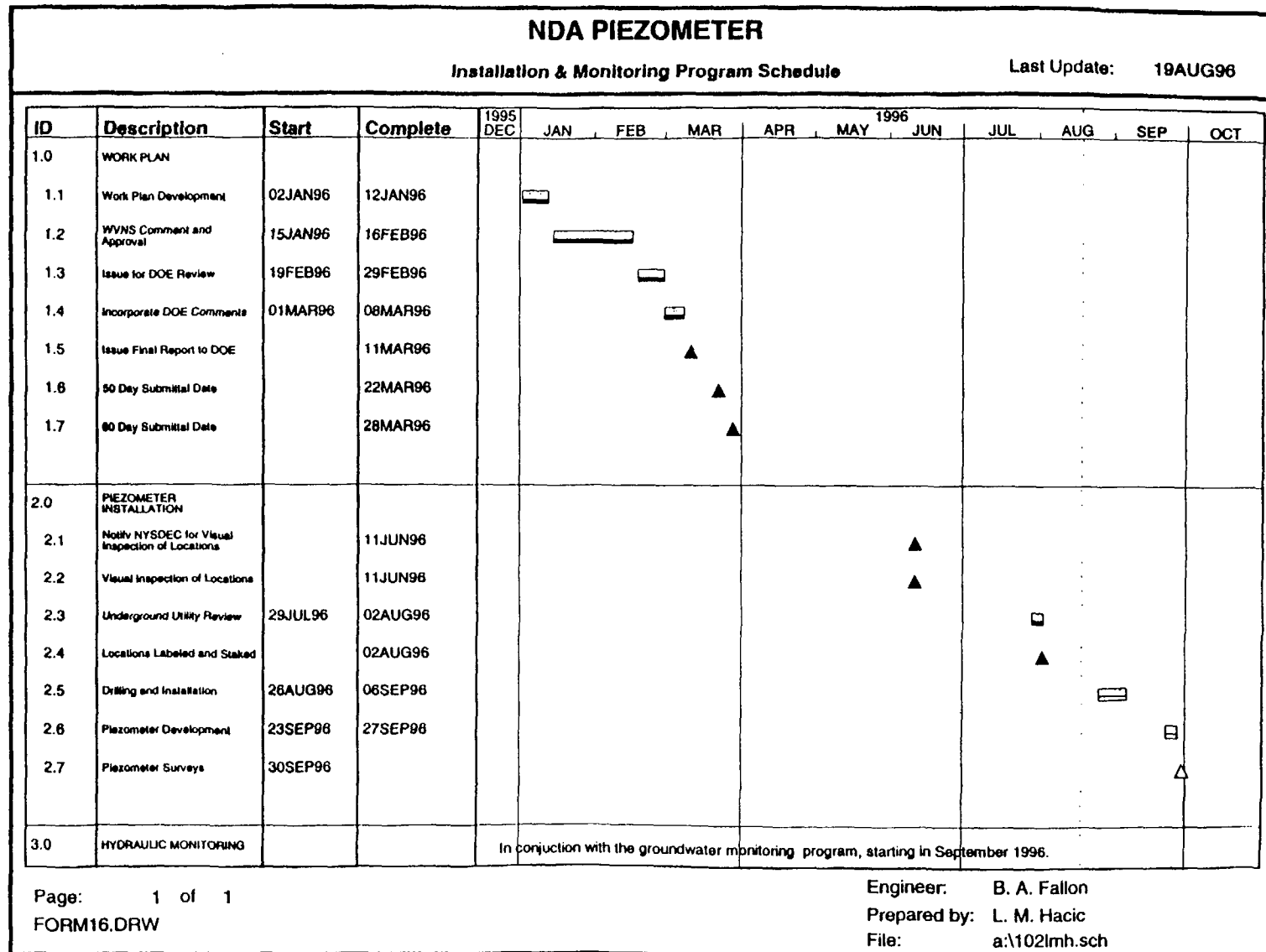
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	DESCRIPTION	TOLERANCES		CHECKER	DATE	FOR		
	0	2PL DEC ± N/A	3PL DEC ± N/A	* DO NOT SCALE DRAWING	ENGINEER S. KOMASARA	DATE	WEST VALLEY NUCLEAR SERVICES CO., INC. WEST VALLEY N.Y.	
	ER	FRAC TS ± 1/16	ANGLES ± N/A	FINISH N/A	ENVIRONMENTAL PROGRAMS WELL APRON DESIGN DETAILS			
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FIGURE 4



WVNS RECORD OF REVISION

Rev. No.	Description of Changes	Revision On	Dated
		Page(s)	
0	Original Issue	All	09/09/96
FC1	Updated References	4, 5, 6, 7, 8, 9,	10/16/00
	Document has been updated per WVDP-257	All	
	Repaginated to accommodate Field Change	All	

WVNS RECORD OF REVISION CONTINUATION FORM

Rev. No.	Description of Changes	Revision On Page(s)	Dated
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